DESCRIPTION

ELECTRONIC COMPONENT MOUNTING METHOD AND APPARATUS

Technical Field

The present invention relates to an electronic component method and apparatus for mounting on a circuit board an electronic component of, for example, an IC chip and a surface acoustic wave (SAW) device on an electronic circuit use printed board (referred to as a "board" as a representative example in the present specification, and the "board" means a mounting base object on which other components such as an interposer and/or an electronic component are mounted) in a single body (a bear IC in the case of an IC chip) state, and relates to an electronic component unit obtained by mounting the electronic components on the board by the mounting method.

Background Art

In these days, electronic circuit boards have come to be used in various sorts of products, and the performance thereof has been improved day by day with increased frequencies used on the circuit boards. Flip chip mounting, which provides reduced impedance, is a mounting method suitable for electronic equipment that uses high frequencies. There is also demanded flip chip mounting for mounting on a circuit board an IC chip not in

a package style but in a bear component style in compliance with the increase in number of portable devices. For this reason, when IC chips are mounted as a single chip on a circuit board or mounted on electronic equipment and a flat panel display, the IC chips include a certain amount of defective ones. Other than the flip chip, CSP (Chip Size Package), BGA (Ball Grid Array) and so on have been increasingly employed.

As a conventional method for bonding an IC chip onto the circuit board of electronic equipment (first prior art), there is the method disclosed in Japanese Examined Patent Publication No. 06-66355 and so on. This is shown in Fig. 15. As shown in Fig. 15, there is generally known the method of transferring an Ag paste 74 onto an IC chip 71 provided with bumps 73 for connection to electrodes 75 of a circuit board 76, thereafter hardening the Ag paste 74 and thereafter pouring an encapsulating material 78 between the IC chip 71 and the circuit board 76.

As a method for connecting an IC chip to a liquid crystal display (second prior art), as disclosed in Japanese Examined Patent Publication No. 62-6652 shown in Fig. 16, there is generally known a semiconductor chip connection structure in which an anisotropic conductive film 80 is employed, and by peeling off an anisotropic conducting adhesive layer 81 constituted by adding

conductive minute segments 82 into an insulating resin 83 from a separator 85 and applying the film onto a board or the glass of a liquid crystal display 84 and thermocompression-bonding an IC chip 86, the anisotropic conducting adhesive layer 81 is interposed between a lower surface of the IC chip 86 and the board 84 except for spaces under the Au bump 87.

As a third prior art, there is known a method for applying a UV-curing resin onto a board, hardening the resin located between the two by UV irradiation while mounting an IC chip on it with pressurization, and maintaining a contact between the two by the contracting force of the resin.

As described above, the IC chip bonding has been performed by performing the processes of die-bonding an IC chip of a flat package or the like onto a lead frame, connecting the electrodes of the IC chip to the lead frame by wire bonding, forming a package with resin encapsulation, thereafter printing a solder paste on the circuit board, mounting the flat package IC thereon, and subjecting the IC to reflow. According to the above-mentioned method called SMT (Surface Mount Technology), the process of packaging the IC is long and requires much time for the production of IC components, and it has been difficult to miniaturize the circuit board. For example, an IC chip encapsulated in a